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ABSTRACT

Designed to assist persons charged with the preparation of planning proposals that meet the requirements of the program of federal assistance to vocational education, this booklet reviews several types of planning strategies. After introductory comments, the booklet lists several steps that all planners should incorporate into their strategy: (1) define the problem to be solved; (2) delimit the problem within the context of available resources; (3) analyze the probable reactions of all groups involved or influenced and determine their ability to influence, either favorably or adversely, the implementation of any problem-solving plan; (4) analyze the political, economic, social, and technological environment; (5) redefine and clarify the problem; (6) develop informal, schematic portrayals of possible patterns of interaction between constituencies; (7) use the decision making process in planning; (8) decide whether decisions will be made in order to get optimal results even at the risk of antagonizing some constituencies, to satisfy as many people as possible, or to modify or amplify that which the organization is already doing; (9) analyze program and demographic trends on an ongoing basis; (10) be aware of the timing of each step in implementation; and (11) modify the plan and the resulting program on the basis of feedback. Arguing that the most critical element of the planning process is the creative phase, the paper describes two techniques to facilitate the development of ideas and planning proposals: the Delphi Technique, which is typically identified as the most efficient approach, and the Delbecq Techniques, which places a premium on reaching consensus. The Program Evaluation Review Technique, the Gantt technique, and Scope and Sequence technique are described as means of plotting the implementation of the plan chosen. Charts illustrating the use of a Scope and Sequence method to develop a career placement center are provided. Finally, the booklet underscores the importance of information on the occupational demand for a program in obtaining federal monies. Appendixes include a list of occupations ranked by projected openings in Hawaii from 1988 to 1996 and a set of charts analyzing the availability of vocational education programs at Hawaii secondary schools and community colleges. (VVC)

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State Board For Vocational Education

Office of the State Director for VOCATIONAL EDUCATION

PLANNING RESOURCE AID

1989

William A. Broadbent

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Preface

The following brief document is an update of a planning guide prepared in 1981 when reauthorization of the Educational Amendments of 1976, Title II, PL 94-482 was being discussed. Reauthorization was not accomplished until late 1984. This material is designed to facilitate the work of local agencies in preparing local educational agency (LEA's) proposals for participation in the federal assistance act. Some new material has been added, some old material has been deleted and some material is pretty much the same. The generic aspects of good planning do not change although the specific strategy may.

It must be recognized that uncertainty about the future, the unavailability of certain kinds of data, and the need to operate within the cost-benefit concept may cause the data base and techniques to fall short of a desired level of sophistication and accuracy. However, the consensus among educational decision-makers indicates that gains derived from planning based on systematic labor and supply forecasts exceed those derived from planning in the absence of forecasting.

Effective occupational program planning involves identifying the target populations to be served and establishing priorities; determining the appropriate packaging, mix, and sequence of services to be provided to the target groups; and selecting the most cost-effective delivery system. The successful orchestration of the above considerations will result in minimizing fragmented, duplicative, and competing programs.

It is our sincere hope that the educational agencies will use this resource guide to provide the range of services for all groups according to the varying needs of each.

Introduction

From the outset of the federal assistance program to vocational education, states and operating agencies have had to be accountable for the funds they expended. This required some sort of plan. The Educational Amendments, Title II, PL 94-482 of 1976 were very specific as to the content of such plans. In the Carl Perkins Vocational Education Act of 1984, PL 94-524, the requirements were less specific but the mandate clearly elucidated. In 1990 we will probably see new legislation. This will result in the necessity to organize planning documents in conformity with the new law. Plans will have to be developed at the state and local educational agency (LEA) levels.

The new law may be somewhat like the Carl Perkins Act. If that is the case, there will be set-asides for special populations and some monies available for program improvement. Even if funding is obtained on the basis of a continuing resolution, new state plans will need to be developed. Given the framework of the existing law and/or the probable new law, the process will be essentially the same. At the state level, the State Board for Vocational Education will agree to abide by the set-asides, program improvement requirements, and other categorical grant provisions. The State will also describe in broad brush strokes how the State will accomplish these objectives and accommodate the provisions of the federal assistance act. The detail will be left to the LEA proposals. Building from the school and campus levels, each operating agency will define how it will attempt to achieve the objectives and priorities. This will involve input and planning at the grassroots level. Planning at the grassroots level is being done by involving as many participants as may be affected.

This brief booklet is designed to assist persons charged with planning at the school and college level in the preparation of the planning proposals.

It provides the generic aspects of several types of planning strategies as well as some data on program availability and occupational demand.

The literature on planning can roughly be divided between the "empirical" and the "how to do it" variety. The "how to do it" or normative variety is the more prevalent. However, even empirical contributions are a bit short on measurement and task analysis. It is argued that Gulick and Urwick's taxonomy and similar planning strategies have defined the conceptual parameters of the processes. Other efforts have also sought to delineate the precise steps of the process and rationalize that which is an essentially quasi-conscious procedure. More recently, such overt prescriptions for decision-making such as Planning, Programming, Budgeting (PPBS), Planning Management and Evaluation (PME), and zero-based budgeting have been heralded by theorists as

mechanisms whereby even those with limited administrative experience can become highly systematic and precise planners.

The thing that most advocates of normative planning would tend to agree upon is that such strategies should make the process an overt and conscious one. Some planners have inherent good sense and judgment. However, when they become removed from the planning mechanism, for whatever reason, they often take their insight with them, leaving no trail to reveal the rationale behind their position or clue to their particular logic.

To assume the stance of a "how to do it" theorist, planning is best accomplished when it is a rational and sequential process. To be more prescriptive, it should be an "outcome" and not a "process" oriented procedure.

Generic Aspects of Planning

The purpose of an organization influences the characteristic pattern of the planning process of that agency. For instance, the modus operandi of the planning process of an emergency services unit will necessarily vary from that of an organization charged with administering retirement benefits. In the first instance, uncertainty is a given, while in the other, operations are governed by such relatively predictable things as actuary tables and the like. In the first case, uncertainty is a given and in the other, basic regularities can be identified and trends analyzed. However, if one may choose to make the process more conscious and treat it as a somewhat generic procedure there are certain steps that all planners should incorporate in their strategy.

1. Define the problem to be solved. Minimize conceptual misunderstandings at the outset.
2. Delimit the problem to be solved or the challenge to be overcome. Do not try to solve all of the world's problems with one project. Plan for what is possible given the resources available.
3. Try to analyze the probable reaction of all groups to be involved or influenced by whatever course of action that is determined upon. These groups are referred to by some planners as "stake holders." A stake holder is anyone who will be affected by the implementation of the plan in a significant way. Some planners recommend that each stake holder should be evaluated in terms of:
   a. The relative importance of the plan's implementation to that individual or group.
   b. The relative ability of the individual or group to influence, either favorably or adversely, the implementation of any possible problem-solving technique or plan.

The position of the stake holder can also be analyzed using the following organizational and power considerations:

4. Analyze the environment in terms of relevant criteria. Factors to be considered include political, economic, social and technological factors.
5. Redefine and clarify the problem on the basis of preliminary analyses.
6. Develop informal, schematic portrayals of possible patterns of interaction and impact between stake holders as part of the brainstorming process.
7. Make overt the decision-making process involved in the planning.

8. Once the reasoning process has been determined, choose the criterion to be employed in making decisions. The major options are:
   optimizing: using this criterion you attempt to move the system as far as possible toward the realization of the organizational objective, even at the cost of antagonizing stake holders inside and outside the system
   satisfying: using this as your criterion you attempt to satisfy as many stake holders as possible. Most groups, particularly the strongest, get something via the solution; but no one gets everything
   incrementalism: using this approach you simply attempt to modify or amplify on that which the organization is already doing. This approach characterizes the planning process in vocational education in many states.
9. Continue to modify your projections of the future during the implementation process by:
   - analyzing program trends,
   - studying shifts in demographic data organized by relevant criteria, soliciting established expertise,
   - using educated best guesses, and
   - implementing sequential analyses.
10. Be continually aware of the "zeitgeist" or "timing" of each implementation step as the plan evolves. This is critical. The right move at the wrong time could prove fatal to the successful implementation of your plan of action.
11. Modify the plan during implementation and after the proposed solution is fully operational through the use of information feedback.
12. As is probably obvious, the critical element of the planning process is the creative phase, whereby various alternatives are identified and examined. This calls for creativity and creativity is one commodity that most organizations generally find in short supply.

The identification of alternatives usually takes place through a process popularly referred to as "brainstorming." Some organizations actually set aside a portion of their administrative offices for this process. Such facilities are frequently referred to as "think tanks."

Brainstorming is usually a collective enterprise. Operating on the assumption, which is open to question, that many minds are invariably better than one, administrators and planners meet and throw out ideas for consideration by the group as they occur. One disadvantage of this approach is that the more junior, and usually younger members, tend to become intimidated in the process by their superiors and the senior staff. Any proposal, which by implication,

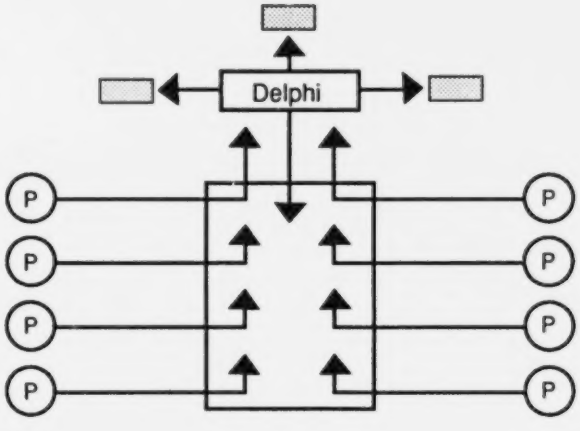
suggests the inadequacy of existing policy and/or procedures to meet an organizational challenge is understandably treated with suspicion by those responsible for the status quo.

13. Two techniques have been developed to facilitate the development of ideas and planning proposals. One is better than the other. The better of the two is known as the Delphi Technique.

    13.1) Delphi Technique

    In ancient Greece, the Oracle at Delphi was a revered source of authority to which individuals, groups, and states often referred their problems. The Oracle was believed to be ascribed with great wisdom and insight. In the Delphi system, (there are several variants) each participant in the planning group prepares a proposed plan or scenario for the Delphi to consider. The submission is coded to protect the participants' anonymity. The Delphi, which may be composed of one or more individuals having established expertise, selects those proposals having the best chance of achieving the objectives as stated, and then resubmits those proposals to the planning participants for further consideration and refinement.* The process is repeated until a plan emerges which is sufficiently holistic and detailed to allow a discussion of operational considerations.

    In this system the Delphi is the key. It is the Delphi who evokes cloture on any given option or component of a plan. Anonymity guarantees that all participants' ideas will be considered on the basis of their innate merit and their merit alone.



*In some situations (e.g., engineering) the Delphi may be a computer or be assisted by a computer.

13.2) Delbecq Technique

This approach places a premium on consensus building. In its conceptual rationale there are shades of Rousseau's "general will" and Calhoun's "concurrent majorities." The technique is very similar to that employed by many multi-national corporations.

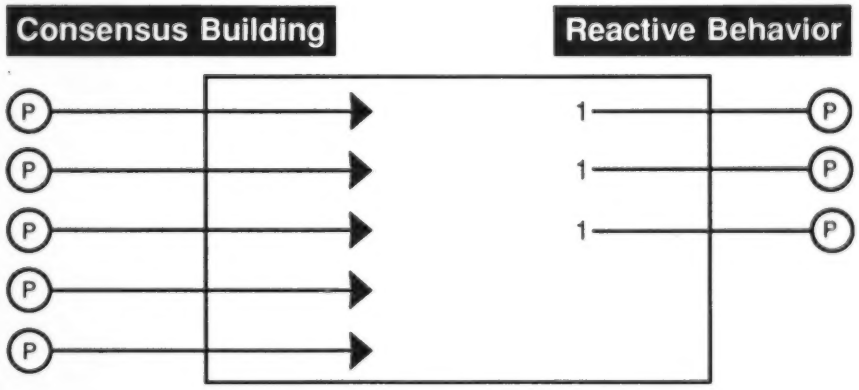
In this technique (there are also many variants of this strategy as well), the planning participants are encouraged to develop one or more proposals to solve some problem or to take advantage of a unique opportunity. The proposals are then circulated to the group as a whole and a general discussion ensues. The proposals are evaluated in terms of:

need: the professional community's interpretation of that which would be preferable

demand: the layman's interpretation of that which would be preferable

Within a short period of time, majority sentiment (sometimes it is only a plurality) usually emerges in favor of one of the options. It is the role of the majority to convince the others that the option, which the greatest number have initially selected, be the choice of the entire group. They may make minor compromises to achieve the desired consensus. If consensus cannot be obtained, the option under consideration is discarded and the process is repeated.

Consensus is considered vital. All members must be on record as favoring the selected plan. Otherwise, it is reasoned they will not work enthusiastically for its successful implementation.



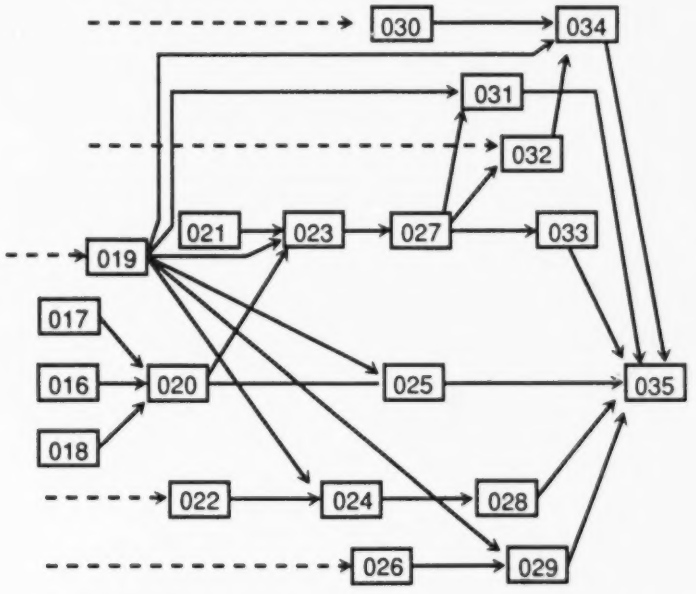
14. Plot the implementation of the successive components of the plan. You may choose to use PERT, GANTT, or Scope and Sequence techniques for this. Other variants and techniques are available. You may wish to develop your own to meet the particular needs of the organization. However, the basic elements of the GANTT, PERT, and Scope and Sequence procedures are relatively simple to understand and use.

14.1) PERT

The acronym PERT refers to "Program Evaluation Review Technique." It was used and refined during the Navy's Polaris developmental program. This complex undertaking involved 250 prime contractors and over 9,000 subcontractors.

A PERT chart for a high school building construction project might resemble the following:

Pert Schedule For A Secondary School's Building Construction Project



Code

016 excavation design completed
017 masonry operations design
018 concrete poured
019 materials begin to arrive
020 foundation completed
021 framing require
022 plumbing requirements determined
023 carpentry work initiated
024 plumbing work initiated
025 masonry work completed
026 electrical requirements determined
027 framing completed
028 plumbing completed
029 wiring completed
030 painting begins
031 roofing undertaken, completed
032 drywall installed
034 painting completed
035 building project completed

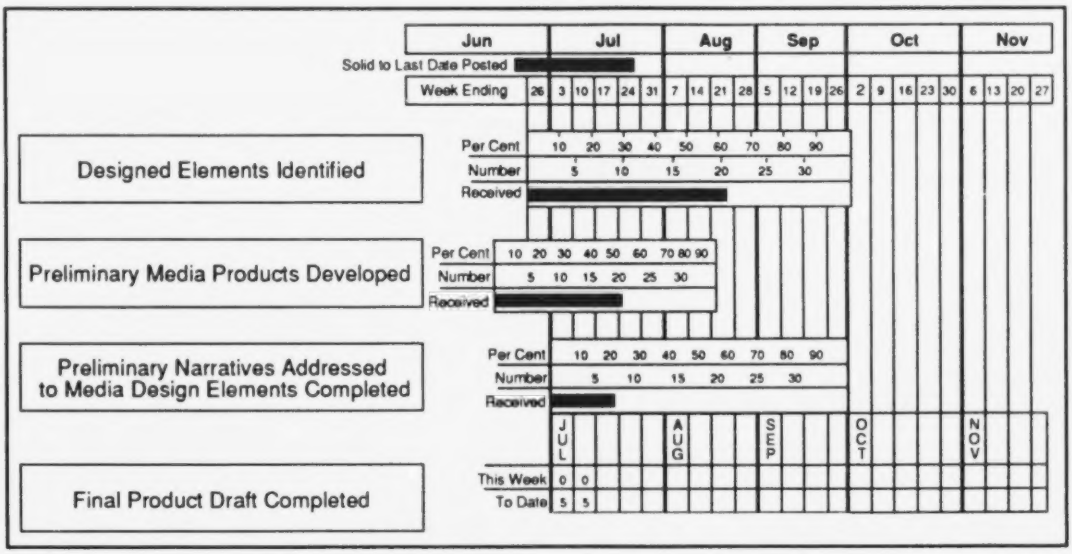
PERT involves three essential requirements. These are: (1) every significant activity, that must take place before a project is completed, is described in succinct but specific terms; (2) the sequence of activities and the relationship of activities are depicted by means of the PERT network or schemata and (3) the time frame is clearly specified for each activity.

Some planners use three different estimates or planning scenarios: the most *pessimistic*, the most *optimistic* and the most *likely*. One variant or supplement to PERT is PERT/cost. In this schematic the dollars estimated for each project component are depicted. This facilitates decision-making based on such factors as cost, time, and benefits.

14.2) GANTT

The GANTT chart is one fairly effective method for depicting that which is to be accompanied and assuring a mechanism of control during the implementation phase. It shows at a glance which parts of a job are behind schedule and makes it possible to recommend remedial action before delays become serious. The salient elements of a GANTT plan for a curriculum development project might resemble the following.

Gnatt Chart For A Curriculum Development Project

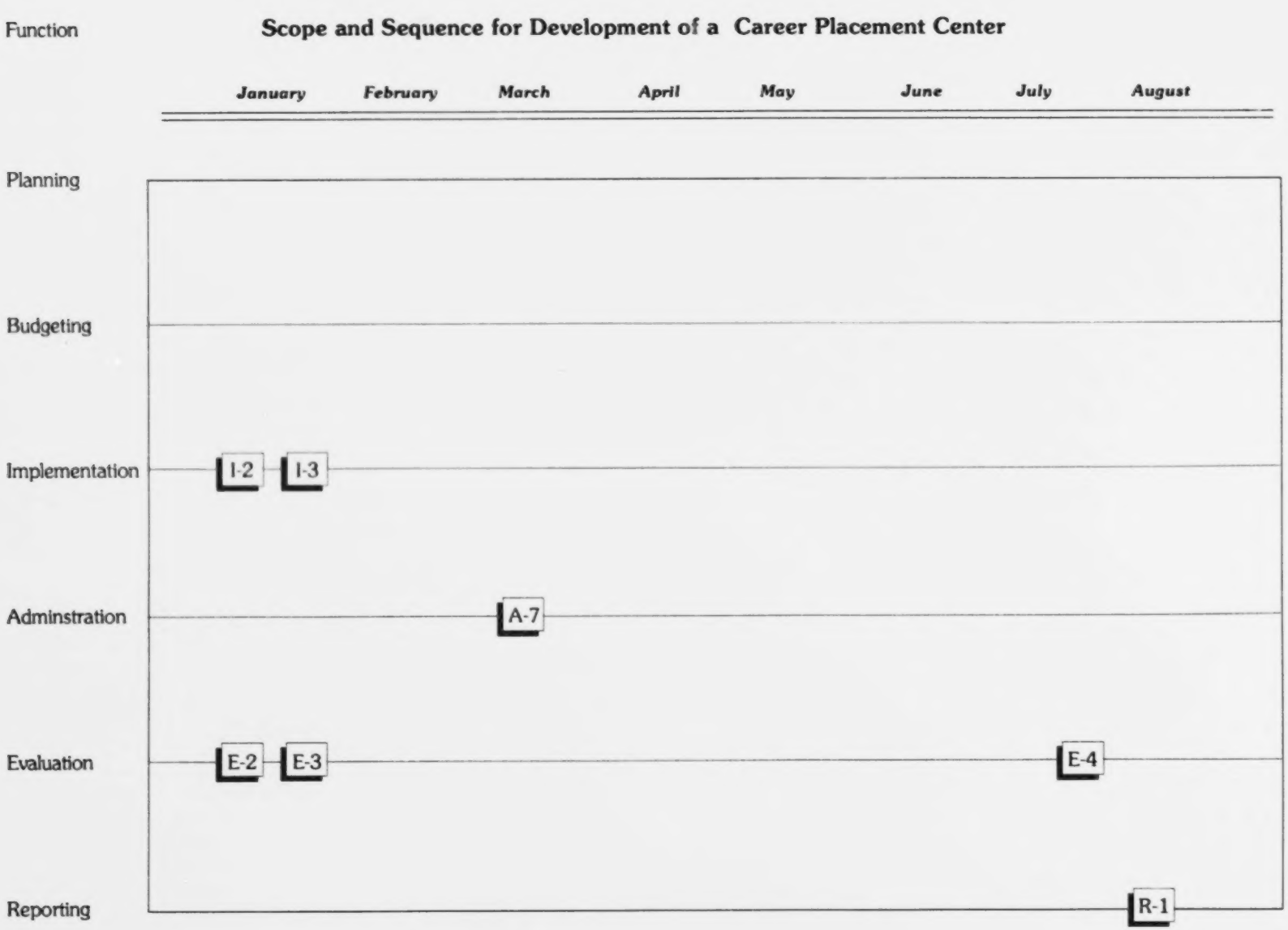


14.3) Scope and Sequence

Scope and sequence are terms used by educators frequently. They are used so frequently they often lose their meaning.

Some educators use scope and sequence to describe a set of lesson plans for a unit of instruction or a course syllabus. However, a proper statement of scope and sequence should illustrate the times of intensive activity and the nature of such efforts. It should then be interfaced with a detailed description of these activities ordered in sequence. The detail should not be so complete or complex that it confuses. It should be circumscribed sufficiently to provide the broad scope of activities to be undertaken and outcomes to be achieved which is comprehensible in a brief reading. It is understood that a greater level of detail is implied. Such a schematic for planning the creation of a career resource center might resemble the following illustration.

Scope and Sequence for Development of a Career Placement Center


Function
Scope and Sequence for Development of a Career Placement Center
January
February
March
April
May
June
July
August
Planning
Budgeting
Implementation
I-2
I-3
Adminstration
A-7
Evaluation
E-2
E-3
E-4
Reporting
R-1

Sequence of Activities

Career Resource Center Project

Code	Activity	Anticipated Outcome	Completion Date
P-1	Develop broad outline of program intentions in conceptual terms	Conceptual schema painted in broad brush strokes	3-1
A-1	Create advisory committee to reference planning specifics against their cumulative experience and expertise	A standing board	4-15
P-2	Develop detailed plan and reference it against advisory committee	Reactions and input	5-15
P-3	Revise plan in accordance with feedback	Revised plan	5-30
B-1	Develop budget upon plan and review with advisory committee	Operating budget	6-1
A-2	Obtain approval from appropriate managerial levels	Approved operational plan	6-15
B-2	Set up account codes disbursement	Codes for use	7-1
A-3	Prepare job descriptions and hire necessary personnel	Job descriptions and personnel action materials	7-15
A-4	Acquire facilities for program	Facilities	8-15
B-3	Purchase needed equipment	Completed purchase orders and system	8-7
B-4	Purchase necessary materials	Materials	8-15
I-1	Pilot test program on fall population	Data on program performance	9-30
E-1	Perform formative evaluation on pilot test and make recommendations	Formative evaluation data	11-15
A-5	Revise guidelines for program operation in light of feedback	New guidelines for the administration of subsequent activities	11-30
A-6	Reference progress against advisory committee	Additional input	12-15
E-2	Develop summative evaluation design... revise formative evaluation program	Evaluation design	1-1
I-2	Revise program at mid-year in accordance with formative evaluation findings	Revised operational guidelines	1-12
E-3	Prepare recommendations to revise guidelines	New directions	1-15
I-3	Implement spring services component in the areas of college and career placement	Placement of students in college, the military and/or jobs	2-1
A-7	Reference programs against advisory committee	Additional input	3-15
E-4	Conduct summative evaluation	Final annual evaluation	6-15
R-1	Prepare first annual report	Final annual report	6-30

15. As previosly mentioned, most of the money in existing and proposed legislation goes to special populations and program improvement. It is in the program improvement area (Section II, Part B of the present law) that most people will probably want to direct their efforts. Under this provision, educators are given the opportunity to establish, expand and/or improve programs. In order to do this, educators need to know what is the occupational demand for the program they are interested in and what available existing programs presently exist by level and area.

    One source of information in this area is the "annual openings" data which is made available by the Hawaii State Occupational Information Coordinating Committee. Data are available in various levels of detail. Most planners would be interested in the average annual openings which are displayed in the fifth column of the table which constitutes the first appendix of this brief document. Many of the occupations involving the greatest demand involve a comparatively low level of skills. However, the reader must look further with this table to obtain information on skilled, well-paying positions. For instance, registered nurses do not appear until the 23rd ranking, but the demand is a healthy 210 openings.

    In order to appreciate the significance of this number you have to look at program availability data that is contained in Appendix 2. Appendix 2 reveals that while nursing is offered in every county in the State, not enough program completers are available to meet the demand.

    Economic development also portends occupational demand. The daily newspapers do a pretty good job of covering major construction projects and discussing other significant developments in the economy. However, the Department of Business and Economic Development has more systematic information. Once a new economic enterprise is announced, developers are usually willing to share information with educators. It involves a *quid pro quo* arrangement on the parts of both parties. If an educator knows that 1,500 new hotel rooms are going to be built in their service area, they can plan new programs to train the required work force. Summary documents such as the "State Vocational Education Document: Planning for the Intermediate Future" produced by the Office of the State Director for Vocational Education augment the other resources.

Demographic data are also a useful referent for planning. Every planner should be privy to the Department of Business and Economic Development's "State of Hawaii Data Book." Enrollment and graduation data in gross categories can be of assistance. It gives the planner a better idea of the general preparation of the labor force. Registration data and diagnostic testing information also provide useful referents. If you are aware, that the community college average age is increasing, you need to adjust your curriculum offerings to meet the special needs of a more mature, older population. More off-hours courses will be needed and flexible schedules will be required to meet their needs.

Low diagnostic test scores signal the need for more remediation. A high incidence of persons showing a language dominance other than English will trigger the need for more courses for the Limited English speakers.

If the trend of targeting monies towards the disadvantaged and handicapped continues, educators will need to become more careful about gauging such things as Chapter I eligibility and counting Pell grant recipients.

There are a lot of data out there. The secret is to use them appropriately.

Appendix A

Rank Order of Job Openings: 1988 - 1995

Prepared by the Hawaii State Occupational Information Coordinating Committee

Explanation

Patrick Stanley, Executive Director, HSOICC

Caution

For certain applications the number of job openings per year is the most critical measure of need in the labor market. It must be pointed out, however, that openings are not the only measure of the shape of that market nor of its dynamics.

Occupational specialties occupy relative niches within the total labor force, and their total size, not just their number of openings, is an important characteristic of the labor economy. Growth rate is still another dynamic that can be considered.

Note: All of these factors have been condensed into a Balanced Rank Order in an earlier HSOICC publication dated May, 1988.

Occupational Title

These titles are gathered from the Occupational Employment Statistics program of the Research and Statistics Office, DLIR.

The OES program surveys over 600 titles in Hawaii. This report lists only 167 titles - only those that contribute at least 25 openings per year.

Some occupational groups lend themselves to a finer breakdown of titles which can give the impression that the group ranks relatively low if only selected titles in the group are examined. For instance, if Sales-Retail, Sales-Reps, Sales-Scientific, Sales-Securities, Sales-Parts, etc. were combined, the general category of Sales would rank as number one with a clear lead.

1988 Estimate

This estimate is based on the most recent survey base figure of 1983 (the 1986 base will be published in 1990).

1995 Estimate

A projected estimate such as this one is based on historic trends as modified by recent parameters such as personal income, mortality, retirement rates, etc.

Average Growth

Between 1988 and 1995, new jobs will be created each year through the forces of economic development. This figure represents each year's contribution to that growth.

Average Replacement
Each occupation has its own rate for persons separating from it due to death, retirement or just quitting. These variances are calculated into the figures shown.

Annual Openings
This figure is the sum of growth and replacements on a yearly basis between 1988 and 1995.

An HSOICC Special Report

A Rank Order of Job Openings: 1988-1995

Rank Title	1988 Estimate	1995 Estimate	Average Growth	Average Replace	Annual Openings
1. Janitors and Cleaners, Exc.Maids	10230	11590	211	770	981
2. Salespersons, Retail	20310	22620	351	617	968
3. Waiters and Waitresses	15070	17820	463	179	642
4. Cashiers	10740	13200	355	186	541
5. First Line Supervisors, Sales	7410	8570	166	344	510
6. Food Preparations Workers	7320	8470	193	275	468
7. General Office Clerks	10600	11390	124	247	371
8. Gardeners and Groundskeepers	3490	3960	65	286	351
9. Comb. Food Preparation, Service	7000	7990	182	165	347
10. Guards and Watch Guards	5060	6110	133	211	344
11. Maids and Housekeeping Cleaners	6410	7250	142	196	338
12. Bookkeeping and Accounting Clerks	9140	9860	120	211	331
13. All Other Helper, Laborer, Mover	7410	7890	79	244	323
14. Cooks, Restaurant	4880	5890	165	147	312
15. All Other Managers and Administ.	4750	5560	110	196	306
16. Secretaries	6990	7290	54	224	278
17. All Other Sales and Related Occ.	1770	2050	39	230	269
18. First Line Supervisors, Clerical	5550	6240	102	156	258
19. General Managers and Top Exec.	4190	4720	80	171	251
20. All Other Service Supervisors	4880	5630	127	118	245
21. Accountants and Auditors	3980	4830	118	125	243
22. Maintenance Repairers, Gen.Util.	4800	5510	103	135	238
23. Registered Nurses	5050	6070	133	77	210
24. Sales Reps.Exc.Scientif. and Retail	3840	4420	83	126	209
25. Dining Room and Bartender Helpers	4230	4930	118	86	204
26. Bartenders	3330	4000	111	70	181
27. All Other Clerical and Adm.Support	5070	5590	73	102	175
28. Truck Drivers, Light	3800	4390	85	87	172
29. Teachers, Elementary	5830	6250	66	104	170
30. All Other Service Workers	2990	3390	59	109	168
31. Physicians and Surgeons	1850	2200	55	102	157
32. All Other Clean, Building Service	3260	3630	54	101	155
33. Instructors, Adult Nonvoc. Educ.	1910	2200	43	108	151
34. Stock Clerks, Sales Floor	3230	3610	56	91	147
35. Carpenters	3460	3760	46	92	138
36. Sewing Mach. Operator, Garment	1990	2110	18	118	136
37. Counter Attendants	3650	4250	101	29	130
38. Hand Packers and Packagers	1520	1760	34	94	128
39. Hosts and Hostesses: Rest., Lounge	1930	2300	62	63	125
40. Teachers, Secondary School	4790	5030	41	79	120

An HSOICC Special Report

A Rank Order of Job Openings: 1988-1995

Rank Title	1988 Estimate	1995 Estimate	Average Growth	Average Replace	Annual Openings
41. All Other Food Service Workers	1860	2150	46	72	118
42. Truck Drivers, Heavy	2990	3270	45	66	111
43. Lawyers	1620	2000	58	51	109
44. Bus Drivers	1830	2270	57	51	108
45. Cannery Workers	1460	1240	-62	164	102
46. All Other Secretaries	2950	3240	41	61	102
47. Housekeepers, Institutional	640	730	15	87	102
48. First Line Superv.:Mech.& Repair	2060	2220	21	77	98
49. Automotive Mechanics	2590	2840	33	63	96
50. Cooks, Specialty Fast Food	1610	1890	48	48	96
51. Typists	3400	3260	-14	107	93
52. Teacher Aides & Educ. Assistants	1430	1680	38	47	85
53. Parking Lot Attendants	1140	1310	22	63	85
54. Electricians	2230	2380	31	53	84
55. Taxi Drivers and Chauffers	740	910	24	59	83
56. Receptionists,Information Clerks	2880	3170	48	35	83
57. Traffic, Shipping, and Rec. Clerks	1920	2130	35	47	82
58. All Other Prof.,Paraprof.,Techn.	2195	2450	37	44	81
59. All Other Hand Workers	610	720	16	63	79
60. Nursing Aides And Orderlies	2660	2880	30	49	79
61. Guides	1310	1510	32	46	78
62. Plumber, Pipefitter, Steamfitter	1970	2090	17	58	75
63. Hairdressers, Cosmetologists	1650	1780	27	48	75
64. Food Service and Lodging Managers	1160	1320	28	46	74
65. Stock Clerks:Stockroom or Wareh.	3330	3290	-1	75	74
66. Financial Managers	1790	2020	33	41	74
67. Legal Secretaries	1240	1530	48	25	73
68. Travel Agents	1260	1440	37	34	71
69. All Other Post Secondary Teacher	1600	1710	18	53	71
70. Laundry, Drycleaning Mach. Oper.	920	1040	19	51	70
71. First Line Superv.:Const.Extrac.	1290	1380	13	55	68
72. Teachers,Preschool and Kindnergarten	1330	1540	35	30	65
73. Painters and Paperhangers	1370	1490	16	48	64
74. All Other HandMaterial Movers	2060	2300	35	28	63
75. Driver/Sales Workers	1160	1300	20	43	63
76. Licensed Practical Nurses	1870	2000	16	47	63
77. Cooks, Short Order	1400	1630	41	20	61
78. Medical Assistants	810	1080	37	23	60
79. All Other Mechanics, Installers	1330	1520	26	34	60
80.Bill and Account Collectors	420	490	9	50	59

An HSOICC Special Report

A Rank Order of Job Openings: 1988-1995

Rank Title	1988 Estimate	1995 Estimate	Average Growth	Average Replace	Annual Openings
81. Service Station Attendants	2380	2520	24	35	59
82. Civil Engineers, Incl. Traffic	1480	1590	15	43	58
83. Reservation and Trans.Ticket Agent	1890	2060	34	21	55
84. Switchboard Operators	1490	1690	29	26	55
85. Computer Systems Analysts, EDP	1300	1590	39	16	55
86. Cooks, Institution and Cafeteria	1070	1200	22	32	54
87. Sales Reps, Scientif.Prod.Exc.Ret	940	1100	23	31	54
88. Butchers and Meat Cutters	1060	1230	22	31	53
89. All Other Constr. and Extractive	240	270	4	49	53
90. Order Clerks: Materials, Service	1060	1220	23	30	53
91. Electrical and Electronic Techns.	1220	1460	30	21	51
92. All Other First Line Supervisors	990	1120	18	33	51
93. All Other Management Support Occ	1460	1670	29	22	51
94. Teachers, Vocational Education	710	780	10	40	50
95. Social Workers, Ex. Med.& Psych.	1070	1190	20	28	48
96. Bakers, Bread and Pastry	880	1020	21	27	48
97. Paralegal Personnel	500	720	32	14	46
98. Securities, Financial Serv.Sales	530	620	13	33	46
99. Dental Assistants	1100	1340	35	11	46
100. Dentists	460	560	15	29	44
101. Hotel Desk Clerks	1220	1360	25	19	44
102. Vehicle, Equipment Cleaners	1270	1440	23	21	44
103. Communication,Transp., Util.Mgrs	730	830	14	30	44
104. Counter and Rental Clerks	1080	1250	22	21	43
105. Operating Engineers	1130	1240	19	24	43
106. Loan and Credit Clerks	1160	1270	20	23	43
107. Sales Agents, Business Services	720	830	19	24	43
108. Postal Mail Carriers	890	1020	22	21	43
109. Billing, Cost and Rate Clerks	1210	1360	21	22	43
110. Bus Drivers, School	750	910	21	21	42
111. Teachers, Special Education	930	990	10	31	41
112. Construction Managers	770	840	10	31	41
113. Amusement Recreation Attendant	920	1040	16	25	41
114. Instructional Coordinators	600	650	7	34	41
115. Insurance Sales Workers	570	630	6	34	40
116. Salespersons, Parts	910	1020	16	23	39
117. Marketing, Adv., Public Rel.Mgrs	780	880	15	24	39
118. Purchasing Agent Ex.Who/Ret/Farm	690	750	9	30	39
119. Flight Attendants	1400	1580	33	5	38
120. Education Administrators	720	780	9	29	38

An HSOICC Special Report

A Rank Order of Job Openings: 1988-1995

Rank Title	1988 Estimate	1995 Estimate	Average Growth	Average Replace	Annual Openings
121. First Line Superv.: Production	880	910	5	33	38
122. Electrical and Electronic Engineer	880	990	13	24	37
123. Personnel,Train.,Labor Rel. Spec	960	1050	13	24	37
124. Electronics Repairers,Comm.and Ind.	1040	1120	9	28	37
125. Custom Tailors and Sewers	330	390	8	29	37
126. All Other Machine Operators	630	710	11	25	36
127. Wholesale, Retail Buyers,Ex.Farm	1050	1190	20	16	36
128. Construction, Building Inspector	480	510	5	30	35
129. All Other Engineers	630	710	10	25	35
130. Counselors	870	960	15	20	35
131. All Other Transportation Workers	620	710	15	20	35
132. Correction Officers and Jailers	750	930	25	9	34
133. Welders and Cutters	860	930	10	24	34
134. Librarians, Professional	680	730	7	27	34
135. Barbers	230	230	2	31	33
136. Pressing Mach.Operator, Textiles	260	280	4	29	33
137. Musicians, Instrumental	500	570	11	21	32
138. Bus, Truck, Diesel Eng. Mechanic	800	890	12	20	32
139. Clergy	300	350	9	23	32
140. Typist, Word Processing Equip.	820	950	20	12	32
141. Demonstrators, Promoters, Models	240	290	7	25	32
142. First Line Superv.: Transport.	560	630	10	22	32
143. Transportation Agents	820	870	13	19	32
144. Drafters	1170	1260	11	20	31
145. Property, Real Estate Management	290	330	6	24	30
146. All Other Protective Service	1340	1440	15	15	30
147. Automotive Body,Related Repairer	780	900	14	16	30
148. Fire Fighters	1710	1850	21	9	30
149. Central Office and PBX Instal/Rpr.	880	950	6	24	30
150. Compliance and Enforce. Inspectors	950	1000	8	21	29
151. Police Patrol Officers	1670	1780	17	12	29
152. All Other Engineering Techn.	900	980	10	19	29
153. All Other Health Service Workers	550	610	9	20	29
154. Packaging and Filling Machine Oper.	630	700	9	20	29
155. Tellers	2410	2510	14	14	28
156. Instructors and Coaches, Sports	390	430	7	21	28
157. Messengers	440	480	6	22	28
158. Announcers, Radio and TV	290	340	7	21	28
159. Medical Secretaries	540	650	16	11	27
160. Dispatchers: Exc. Pol.,Fire,Amb.	620	730	15	12	27

An HSOICC Special Report

A Rank Order of Job Openings: 1988-1995

Rank Title	1988 Estimate	1995 Estimate	Average Growth	Average Replace	Annual Openings
161. Aircraft Pilots,Flight Engineers	650	770	20	7	27
162. All Other Science Technicians	600	650	8	18	26
163. Pharmacists	430	510	11	15	26
164. Bill., Post, Calculating Mach.Op.	420	480	10	16	26
165. Administrative Services Manager	440	500	8	18	26
166. Child Care Workers	420	460	8	17	25
167. Computer Operators, Exc. Periph.	840	980	19	6	25

Summary Of Job Openings By Occupational Group

Occupational Group	1988 Estimate	1995 Estimate	Annual Openings
Total, All Occupations	445,210	497,850	21,097
Managerial & Administrative	17,220	19,550	1,008
Professional, Paraprofessional, & Technical	79,690	89,220	3,449
Sales	55,180	63,610	3,122
Clerical & AdministrativeSupport	84,340	90,650	2,923
Service	110,160	126,770	5,951
Agricultural, Forestry, & Fishing	4,610	5,180	408
Production, Operating, & Maintenance	94,020	102,860	4,234

Appendix B

Program Availability of Vocational/Technical Training

Analysis of Availability of Vocational Education
Honolulu County Vocational Education Program

INSTITUTIONAL LEVEL	PROGRAMS																		
SECONDARY:	Agricultural Occupations		Business/Distributive Occupations		Personal Public Service Occupations			Health Occupations			Food Service Occupations	Electrical/Electronics Occupations		Construction Civil Tech. Occupations	Mechanical Occupations		Technical Graphic Occupations	
Pre-Industrial Preparation	Agri. Bus.	Orn. Hort	Office	Dist.	House Keeping	Child Care	Human Service	M/D Asst.	Nurses Aide	Tech. Aide	Food Service	Electrical	Electronics	Building Const. Tech.	Power Auto	Metal Tech.	Graphic Art	Draft.
Honolulu District																		
Farrington						•			•		•			•	•	•	•	
Kaimuki														•				
Kalani												•			•			
McKinley											•							
Roosevelt															•			
Kaiser																	•	
Central District																		
Aiea			•															
Leilehua																	•	
Mililani														•				
Moanalua														•				
Radford			•															
Waialua		•									•				•			
Leeward District																		
Campbell														•				
Nanakuli															•		•	
Waipahu																		
Waianae			•								•				•	•		
Pearl City															•			
Windward District																		
Castle														•				
Kahuku	•														•			
Kailua															•			
Kalaheo															•			

Honolulu County Vocational Education Program

INSTITUTIONAL LEVEL	PROGRAMS																
	Agricultural Occupations		Business/Distributive Occupations		Personal Public Service Occupations			Health Occupations			Food Service Occupations	Electrical/Electronics Occupations		Construction Civil Tech. Occupations	Mechanical Occupations		Technical Graphic Occupations	
SECONDARY:																	
Introduction to Vocations	Agri. Bus.	Orn. Hort	Office	Dist.	House Keeping	Child Care	Human Service	M/D Asst.	Nurses Aide	Tech. Aide	Food Service	Electrical	Electronics	Building Const. Tech.	Power Auto	Metal Tech.	Graphic Art	Draft.
Honolulu District																	
Farrington			•	•							•		•		•		•	
Kaimuki			•			•					•		•	•	•	•	•	•
Kalani			•										•	•	•			
McKinley		•	•	•		•					•		•		•		•	
Roosevelt			•	•									•	•	•			•
Kaiser			•	•									•		•		•	
Central District																		
Aiea			•	•							•				•			
Leilehua	•	•	•											•	•			
Mililani			•	•							•		•					
Moanalua			•	•							•		•		•			
Radford			•									•		•	•			•
Waialua	•	•	•								•		•	•	•			•
Leeward District																		
Campbell		•	•	•		•					•		•		•		•	•
Nanakuli		•	•								•		•		•	•	•	
Waipahu	•	•	•	•							•		•		•			•
Waianae		•	•	•							•		•		•	•		
Pearl City			•	•							•		•	•	•	•	•	
Windward District																		
Castle	•	•	•	•		•							•		•	•		
Kahuku	•	•	•	•										•				
Kailua	•	•	•	•							•			•	•	•	•	
Kalaheo			•	•									•	•				

Honolulu County Vocational Education Program

INSTITUTIONAL LEVEL	PROGRAMS														
SECONDARY:	Agricultural Occupations	Business/ Distributive Occupations		Personal Public Service Occupations				Health Occupations		Food Service Occupations	Electrical/Electronics Occupations	Construction Civil Tech. Occupations	Mechanical Occupations	Technical Graphic Occupations
Occupational Skills	Ground Maintenance	Gen. Office	Gen. Dist.	Child Care	Home Service	Clothes Maint.	H/M House.	Nurses Aide	Technician	Supervised Food Service	Shop Maintenance	Construction Tender	General Mechanic	Shop Building Maintenance
Honolulu District														
Farrington										•			•	
Kaimuki	•				•							•	•	
Kalani	•	•				•				•				
McKinley	•	•	•											
Roosevelt			•							•	•	•	•	
Kaiser	•		•							•				
Central District														
Aiea	•	•	•			•				•		•	•	
Leilehua					•	•				•		•	•	
Mililani	•	•	•							•		•	•	
Moanalua		•			•					•	•			
Radford	•				•					•		•	•	•
Waialua	•					•				•		•	•	
Leeward District														
Campbell				•						•		•	•	
Nanakuli	•		•			•				•				
Waipahu	•		•							•	•	•	•	
Waianae	•		•							•		•	•	
Pearl City	•	•				•				•		•		
Windward District														
Castle	•	•	•			•				•		•	•	•
Kahuku		•		•		•				•		•	•	•
Kailua	•	•	•	•	•	•	•			•		•	•	
Kalaheo		•												

Maui County Vocational Education Program

INSTITUTIONAL LEVEL	PROGRAMS																	
SECONDARY	Agricultural Occupations		Business/ Distributive Occupations		Personal Public Service Occupations			Health Occupations			Food Service Occupations	Electrical/Electronics Occupations		Construction Civil Tech Occupations	Mechanical Occupations		Technical Graphic Occupations	
Pre-Industrial Preparation	Agri. Bus.	Orn. Hort	Office	Dist.	House Keeping	Child Care	Human	M/D Asst.	Nurses Aide	Tech. Aide	Food Service	Electrical	Electronics	Building Const. Tech.	Power Auto	Metal	Graphic Art	Draft.
Baldwin	•													•				
Hana															•			
Lahainaluna	•													•	•			
Lanai																		
Maui															•			
Molokai	•													•				
Introduction to Vocations																		
Baldwin	•	•	•	•							•				•			
Hana	•	•	•								•			•				
Lahainaluna	•	•	•	•							•				•			
Lanai			•											•	•			
Maui		•	•	•							•			•	•	•		
Molokai	•	•	•											•				
Occupational Skills	Ground Maintenance		Gen. Office	Gen. Dist.	Child Care	Home Service	Clothes Maint.	H/M House	Nurse Aide	Technician	Supervised Food Service	Shop Maintenance		Construction Tender	General Mechanic		Shop Building Maintenance	
Baldwin	•			•			•				•			•				
Hana	•													•				
Lahainaluna	•										•			•				
Lanai	•						•				•			•				
Maui	•		•	•	•	•	•	•			•	•		•	•			
Molokai	•					•					•	•		•	•			
POST-SECONDARY																		
Maui Comm. College: 24 Employment Trng. Office: 3 (E)	Nursery & Flor. Mgt. Hort.& Land Maintenance Nursery Mgt. Veget. Mgt.		Accounting. Dist. Ed. Gen. Off. Trng. Hotel Op. Sec. Science) Clerical (E)		Fashion Tech. Educational Assist. Health Aide Police Science Social Service Aide				Nursing (A.S.) Practical Nursing Emerg. Med. Ser. (E)		Food Serv. Food Serv. (I)			Build. Maint. Carpentry Welding	Auto Body Rep. & Paint Auto Mech.		Drafting	

Kauai County Vocational Education Program

INSTITUTIONAL LEVEL	PROGRAMS																	
	Agricultural Occupations		Business/ Distributive Occupations		Personal Public Service Occupations			Health Occupations			Food Service Occupations	Electrical/Electronics Occupations		Construction Civil Tech. Occupations	Mechanical Occupations		Technical Graphic Occupations	
SECONDARY																		
Pre-Industrial Preparation	Agri. Bus.	Orn. Hort	Office	Dist.	House Keeping	Child Care	Human	M/D Asst.	Nurses Aide	Tech Aide	Food Service	Electrical	Electronics	Building Const. Tech.	Power Auto	Metal	Graphic Art	Draft.
Kapaa													•		•			
Kauai			•															
Waimea															•			
Introduction to Vocations																		
Kapaa	•	•	•								•		•	•				
Kauai	•	•	•	•										•	•			
Waimea	•	•	•	•											•	•		
Occupational Skills	Ground Maintenance		Gen. Office	Gen. Dist.	Child Care	Home Service	Clothes Maint.	H/M House	Nurse	Technician	Supervised Food Service	Shop Maintenance		Construction Tender	General Mechanic		Shop Building Maintenance	
Kapaa	•			•	•	•	•				•			•	•			
Kauai	•		•	•		•	•				•				•			
Waimea	•			•							•			•	•			
POST-SECONDARY																		
Kaual Comm. College: 11* Employment Trng. Office: 1 (E)			Accounting Clerical Mgmt. Sec. Science		Early Child Ed.				Nursing (A.S.) Practical Nursing Emerg. Med. Serv. (E)		Culinary Arts	Elec. Install. & Maintenance Technology		Carpentry Welding	Auto Body Rep. & Paint Auto. Mech.			

Hawaii County Vocational Education Program

INSTITUTIONAL LEVEL	PROGRAMS																	
	Agricultural Occupations		Business/ Distributive Occupations		Personal Public Service Occupations			Health Occupations			Food Service Occupations	Electrical/Electronics Occupations		Construction Civil Tech. Occupations	Mechanical Occupations		Technical Graphic Occupations	
SECONDARY:																		
Pre-Industrial Preparation	Agri. Bus.	Orn. Hort	Office	Dist.	House Keeping	Child Care	Human Service	M/D Asst.	Nurses Aide	Tech. Aide	Food Service	Electrical	Electronics	Building Const. Tech.	Power Auto	Metal Tech.	Graphic Art	Draft.
Hilo														•	•			
Honokaa															•			
Ka'u														•				
Kohala	•														•			
Konawaena	•	•	•								•			•	•	•		
Laupahoehoe															•			
Pahoa															•			
Introduction to Vocations																		
Hilo	•	•	•	•		•							•	•	•			
Honokaa	•	•	•												•			
Ka'u	•	•	•												•			
Kohala	•	•	•											•	•			•
Konawaena	•	•	•	•							•			•	•	•		
Laupahoehoe	•	•	•											•				
Pahoa	•	•	•												•			
Waiakea	•		•	•							•		•	•	•			
Occupational Skills	Ground Maintenance		Gen. Office	Gen. Dist.	Child Care	Home Service	Clothes Maint.	H/M House	Nurse Aide	Technician	Supervised Food Service	Shop Maintenance		Construction Tender	General Mechanic		Shop Building Maintenance	
Hilo	•			•	•						•				•			
Honokaa	•		•	•							•				•			
Ka'u	•			•			•				•			•	•			
Kohala			•		•						•			•				
Konawaena			•		•						•			•				
Laupahoehoe						•												
Pahoa			•	•	•						•				•			
Waiakea	•		•	•			•				•			•	•			

Post Secondary

University Of Hawaii At Hilo,
Hawaii Community College*

*Note: Administered by the University of Hawaii, Office of the Chancellor for the University of Hawaii at Hilo.

Program Area	Major	Honolulu CC	Kapiolani CC	Kauai CC	Leeward CC	Maui CC	Windward CC	Employment Training Office
General/Pre-professional	Liberal Arts	•	•	•	•	•	•	
	Industrial Education	•						
	Accounting		•	•	•	•	•	
	Business		•	•		•	•	
	Clerical	•	•	•	•	•	•	•
	Computer Science/Data Proc.		•		•			
	Finance						•	
	Office Administration and Technology	•	•	•	•	•	•	
	Sales/Management		•	•	•	•		
	Visitor Industry			•				
Health Service	Dental Assisting		•					
	Emergency Medical Services		•					
	Medical Assisting		•					
	Medical Lab Technology		•					
	Nursing		•	•		•		
	Occupational Therapy Asst.		•					
	Radiology Technology		•					
	Respiratory Therapy		•					
	Home Health Aide		•					
	Mobil Intensive Care Technician		•					
	Emergency Medical Technician		•					
Public Services	Fire Science	•						
	Human Services	•				•		
	Legal Assistant		•					
	Occupational Safety & Health	•						
	Administration of Justice	•				•		
	Recreational Instructor				•			
	Early Childhood Education			•				

Program Area	Major	Honolulu CC	Kapiolani CC	Kauai CC	Leeward CC	Maui CC	Windward CC	Employment Training Office
Food Service	Commerical Baking	•						•
	Food Service		•		•	•		•
Technology	Aeronautics	•						
	Agriculture					•	•	
	Applied Trades	•						
	Auto Body Rep. & Paint	•		•		•		•
	Auto Mechanics Tech.	•		•	•	•	•	•
	Building Maint. Tech.					•		
	Carpentry	•		•		•		
	Commercial Art	•						
	Cosmetology	•						
	Drafting Technology	•			•	•		
	Electrical Instal. & Maint.	•		•				
	Electronic Technology	•						
	Engineering Technology	•						
	Fashion Technology	•				•		
	Graphic Arts				•			
	Heavy Equip. Maint. & Rep	•						
	Machine Shop Technology	•						
	Marine Pipefitter	•						
	Refrigeration & Air Cond.	•						
	Sheet Metal & Plastics Tech.	•						
	Ship Repair	•						
	Television Production				•			
	Welding Technology	•		•		•		

Programs Offered By The University Of Hawaii At Hilo, Hawaii Community College

Occupational Area	Program
Agricultural	Agriculture
Business/Distributive	Accounting Data Processing General Clerical Sales and Marketing Office Administration and Technology
Personal/Public Service	Fashion Technology Early Childhood Education Administration of Justice
Health Occupations	Nurses Aide Nursing (AS) Practical Nursing Pre-Nursing Emergency Medical Services (ETO)
Food Service	Food Service
Electrical/Electricians	Electricity Electronics
Construction	Carpentry
Trade and Industry	Auto Body Repair and Painting Auto Mechanics Diesel Mechanics Machine Technology Welding and Sheet Metal
Technical/Graphic	Art Drafting Engineering Aide

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